

May 12, 2004

MEMORANDUM TO: Dan Gillen, Deputy Director
Decommissioning Directorate
Division of Waste Management
and Environmental Protection
Office of Nuclear Material Safety
and Safeguards

FROM: William C. Huffman, Project Manager /RA/
Decommissioning Directorate
Division of Waste Management
and Environmental Protection
Office of Nuclear Material Safety
and Safeguards

SUBJECT: SUMMARY OF APRIL 21, 2004, MEETING WITH PACIFIC GAS & ELECTRIC
AND AAR TO DISCUSS BLISTERING ON BORAL MATERIAL USED IN THE
SPENT FUEL POOL AT THE DECOMMISSIONING HUMBOLDT BAY PLANT

On April 21, 2004, a meeting was held at the U.S. Nuclear Regulatory Commission (NRC) offices in Rockville, Maryland, with licensee representatives from Pacific Gas & Electric Company (PG&E), and Boral vendor, AAR, to discuss blistering observed on Boral material used in the spent fuel pool at the decommissioning Humboldt Bay nuclear power plant. Boral is a neutron absorbing material (neutron poison) manufactured by AAR and used for beyond design basis criticality control in the Humboldt Bay spent fuel pool. Specifically, Boral has been formed into cans that surround 389 individual spent fuel assemblies stored in the Humboldt spent fuel pool. The Boral cans, which were placed into the spent fuel pool in the mid-1980's, provide protection against beyond design basis earthquakes or heavy load drops that might significantly rearrange the spent fuel geometry or crush the fuel assemblies to create a potential criticality concern. The Boral cans ensure that K-eff will remain less than 0.95 even with a significant change in spent fuel storage geometry.

While performing spent fuel pool characterizations in November 2003, the licensee observed blisters on some of the Boral cans. A video-camera examination of the outside surfaces of 387 of the 389 Boral cans revealed 22 cans with some level of blistering. Eleven of the cans have only one or two blisters, the remaining 11 cans have blisters numbering in the dozens. The blisters range in size from dimes to quarters and are raised approximately 1/16 to 1/8 inch in height from the surface of the can. The blisters are located primarily in the bottom third of the can's length. Photos of the blisters were shown to the staff during the meeting. The current locations of cans with blisters was plotted on a plan schematic of the pool and no pattern was apparent.

The Boral vendor, AAR, believes the blistering is caused by water that somehow migrates into the Boral resulting in a chemical reaction with the Boral cermet of boron-carbide and aluminum.

AAR stated that it has seen other examples of this type of blistering and has altered the manufacturing process to minimize future occurrences of blistering.

Discussions took place on the similarities between the Humboldt blistering and a recent report pursuant to 10 CFR 21 of Boral blistering on test coupons from the Seabrook spent fuel pool (ADAMS Accession Nos: ML032650709 and ML032880525).

The licensee noted during the meeting discussions that the Boral can blisters did not have an impact on moving fuel assemblies in or out of the Boral cans or spent fuel pool racks. PG&E also stated that the Boral cans will not be used when the Humboldt spent fuel is transferred to dry cask storage.

The licensee observed no evidence that the blistering has resulted in any loss or separation of the Boral from the cans. Based on the information provided by AAR and investigations by Seabrook, PG&E believes that the blisters do not affect the neutron absorbing properties of the Boral material. PG&E also stated that there appeared to be no impact on the structural integrity of the Boral cans based on the lifting and handling of the Humboldt fuel assemblies with the Boral cans attached. PG&E has determined the blistering not to be safety significant.

The meeting attendance list and a copy of the non-proprietary slides presented by PG&E are attached. The presentation made by AAR on the manufacturing details of Boral and the likely causal mechanism of the blistering was proprietary and no handouts of the slides were disseminated by AAR or retained by the NRC. AAR filed an affidavit for withholding information for the proprietary portion of this meeting on April 15, 2004 (ADAMS Accession No ML041180280). This meeting was noticed on April 6, 2004. No regulatory decisions were made during the meeting.

Docket Nos.: 50-133

Attachments: Attendance List
Presentation Slides (ADAMS Accession No. ML041170176)

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OFFICE	DWMEP/PM	DWMEP	DWMEP/SC
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Attendance List For
Meeting with Pacific Gas & Electric (PG&E) and AAR
to Discuss Boral Blistering Observed at the Humboldt Bay Spent Fuel Pool

April 21, 2004

<u>Name</u>	<u>Organization</u>
Jeff Moore	AAR
Jim Hobbs	AAR
Roy Willis	PG&E Humboldt Bay
John Galle	PG&E Humboldt Bay
David Sokolsky	PG&E Humboldt Bay
John Albers	PG&E Humboldt Bay
Claudia Craig	Decommissioning Directorate, NMSS, NRC
Bill Huffman	Decommissioning Directorate, NMSS, NRC
Carolyn Lauron	Materials & Chemical Engineering Branch, NRR, NRC
Martha Barillas	Reactor Systems Branch, NRR, NRC
Dennis Galvin	High Level Waste Repository Safety, NMSS, NRC
Stu Brown	Spent Fuel Projects Office, NMSS, NRC
Chris Brown	Spent Fuel Projects Office, NMSS, NRC
Louise Lund	Materials & Chemical Engineering Branch, NRR, NRC
Greg Makar	Materials & Chemical Engineering Branch, NRR, NRC
Kris Parczewski	Materials & Chemical Engineering Branch, NRR, NRC
Harold Vandermolen	Office of Nuclear Regulatory Research, DSARE, NRC
Emilio Garcia	NRC Region 4 (Via Phone Bridge)
Alan Merrill	Seabrook Power Station (Via Phone Bridge)
Michael Keith	Seabrook Power Station (Via Phone Bridge)
Audrey Taucher	Fresh Fuel Weekly (Present only during non-proprietary PG&E presentation)